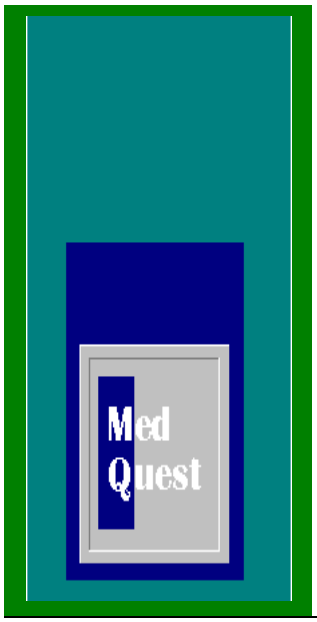

MEDQUEST SOFTWARE

SUPPLEMENTARY INFORMATION: TECHNICAL PAPER # 3

September 30, 1998

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OVERVIEW

INTRODUCTION

This *MedQuest Technical Paper 4: Supplementary Information* is the third in a series of technical papers prepared to provide you with information about the purpose and the specifications of supplemental databases or tables that are used in MedQuest.

DATABASES

The major supplemental databases used in MedQuest include:

- **MMEDS.MDB**. This database is a modified version of the MediSource™ Lexicon database from Multum, Inc. It is used for verification of medication entry, and has been added to the MedQuest suite of software beginning with version 4.10. It includes some of the original tables in addition to the two tables created specifically for use with MedQuest, *category_ingredient* and *category_brand*.
- **MEDS.MDB**. This database consists of Medication Codes (CATEGORIES), Generic Medications (GENERICS), and Drugs (MEDS) tables.
- **ICD9.MDB**. This database contains Diagnosis Codes (ICD9DIAG) and Procedure Codes (ICD9PROC) tables. MedQuest version 4.10 includes version 15 of the ICD-9-CM.
- **ABB.MDB**. This database contains the Abbreviations (ABB) table.
- **CLINDATA.MDB**. This database consists of Laboratory Values (TBLLABNORM), Clinical Help Headings (TBLHEADINGS), and Clinical Help Sources (TBLSOURCES) tables.

MEDISOURCE™ LEXICON DATABASE (MMEDS.MDB)

The MediSource™ Lexicon database is included with the release of MedQuest version 4.10 and any later releases. It is provided free of charge via the Internet by Multum, Inc. to users who agree to acknowledge Multum, Inc. as the provider.

Unlike the medications database that has been released with previous versions of MedQuest, the MediSource™ Lexicon database contains standardized medication and active ingredient names. Multum, Inc. provides regular, cumulative updates to the database.

The tables used in the MedQuest medication data abstraction process are created using SQL queries to join some of the existing tables. Currently there are four tables used, *category_ingredient, category_brand, brand_generic,* and *category_dname*. All but one of the tables used in the SQL queries are kept in the database. That table as well as those tables not currently used (e.g., listings of manufacturers names and addresses, dosage forms) were dropped due to space considerations.

BRAND NAMES BY CATEGORY (CATEGORY_BRAND)

This table is the result of joining the brand name table with the category ID list so that users can look up specific subsets of medications if desired. The category ID is a one to three digit numeric field.

Example

category_id	brand_description
54	Levophed Bitartrate
59	Levoprome
102	Levora
60	Levorphanol Tartrate
103	Levotabs
103	Levothroid
103	Levothyroxine Sodium
103	Levoxyl
89	Levsin
89	Levsin SL
89	Levsin with Phenobarbital
89	Levsinex SR

Table Definition

Object	Name	Data Type	Length
Table	CATEGORY_BRAND (Record Count: 9556)		
Column 1	category_id	Number	4
Column 2	brand_description	Text	45
Index 1	brand_description (Unique: No)		
Index Field	brand_description (Ascending)		
Index 2	category_id (Unique: No)		
Index Field	category_id (Ascending)		

INGREDIENT BY CATEGORY (CATEGORY_INGREDIENT)

This table is the result of a SQL statement that joins the active ingredients with the brand names to link these with the category ID to provide a listing of possible MediSource™ Lexicon categories for active ingredients.

Example

category_id	active_ingredient
60	levomethadyl acetate hydrochloride
102	levonorgestrel
185	levonorgestrel
60	levorphanol tartrate
103	levothyroxine sodium
46	lidocaine
109	lidocaine
137	lidocaine
139	lidocaine
161	lidocaine
16	lidocaine hydrochloride
46	lidocaine hydrochloride
98	lidocaine hydrochloride
109	lidocaine hydrochloride
137	lidocaine hydrochloride
139	lidocaine hydrochloride
12	lincomycin

Table Definition

Object	Name	Data Type	Length
Table	CATEGORY_INGREDIENT (Record Count: 2300)		
Column 1	category_id	Number	4
Column 2	active_ingredient	Text	50
Index 1	active_ingredient (Unique: No)		
Index Field	active_ingredient (Ascending)		
Index 2	category_id (Unique: No)		
Index Field	category_id (Ascending)		

Examples:

- Medication category 46, antiarrhythmic agents includes all substances used to control cardiac arrhythmias. However, it also includes dextrose, since it is listed as an active ingredient in some antiarrhythmic preparations.
- Acyclovir as a brand name as well as an active ingredient is included in the miscellaneous antiviral category, but the active ingredient acyclovir is also included in the topical antiinfectives category.

BRAND NAME BY GENERIC (BRAND_GENERIC)

This table is the result of a SQL statement that joins the brand names with the Multum drug name, which is Multum's form of the more user-friendly generic name.

Example

brand_description	drug_name
Levophed Bitartrate	norepinephrine
Levoprome	methotrimeprazine
Levora	ethinyl estradiol-levonorgestrel
Levorphanol Tartrate	levorphanol
Levotabs	levothyroxine
Levothroid	levothyroxine
Levothyroxine Sodium	levothyroxine
Levoxyl	levothyroxine
Levsin	L-hyoscyamine
Levsin SL	L-hyoscyamine
Levsin with Phenobarbital	L-hyoscyamine-phenobarbital

Table Definition

Object	Name	Data Type	Length
Table	BRAND_GENERIC (Record Count: 8592)		
Column 1	brand_description	Number	4
Column 2	drug_name	Text	60
Index 1	brand_description(Unique: No)		
Index Field	brand_description(Ascending)		
Index 2	drug_name(Unique: No)		
Index Field	drug_name(Ascending)		

CATEGORY BY MULTUM DRUG NAME(CATEGORY_DNAME)

This table is a result of a SQL statement which joins the Multum drug categories and brand names with Multum's shortened generic names.

Example

category_id	brand_description	drug_name
54	Norepinephrine Bitartrate	norepinephrine
54	Levophed Bitartrate	norepinephrine
185	Aygestin	norethindrone
185	Nor-QD	norethindrone
185	Micronor	norethindrone
14	Noroxin	norfloxacin
163	Chibroxin	norfloxacin ophthalmic
185	Ovrette	norgestrel
209	Nortriptyline Hydrochloride	nortriptyline
209	Pamelor	nortriptyline
209	Aventyl HCl	nortriptyline
209	Nortriptyline	nortriptyline

Table Definition

Object	Name	Data Type	Length
Table	CATEGORY_DNAME (Record Count: 9556)		
Column 1	category_id	Number	4
Column 2	brand_description	Text	45
Column 3	drug_name	Text	60
Index 1	brand_description		
Index Field	brand_description (Ascending)		
Index 2	category_id (Unique: No)		
Index Field	category_id (Ascending)		

OLD MEDICATIONS DATABASE (MEDS.MDB)

The old medications database (MEDS.MDB) was included with all releases of MedQuest prior to version 4.10. It includes three lookup tables: CATEGORIES (referred to as Medication Codes), GENERICS (referred to as Generic Medications), and MEDS (referred to as Drugs). Each record listed in the MEDS table pairs the commercial or trade name of the medication with the generic name.

MEDS and GENERICS tables are derived from a commercial database, while the CATEGORIES table is defined by the Medications database user for the specific requirements of the project. The codes are assigned to the generic medications.

MEDICATION CODES (CATEGORIES)

A medication code represents a group of generic medications within the same category as defined in the MedQuest design option. Currently, each code is four characters long and contains only numeric characters between 0 and 9 ("0" may be used in the first position). The codes are assigned to the generic name based on the criteria specified by the MedQuest user. A code may be assigned to as many generics as required.

Example:

- Medication category 1809 (Aspirin) used in certain modules includes generics aspirin, aspirin/buffers, and acetylsalicylic acid.
- Medication category 3622 (Immunosuppressants) used in another module includes generics lymphocyte immune globulin and muromonab-cd3.

Table Definition

Object	Name	Data Type	Length
Table	CATEGORIES (Record Count: 36)		
Column 1	CODE	Text	4
Column 2	DESC	Text	30
Index	CODE1 (Unique: Yes)		
Index Field	CODE (Ascending)		

GENERIC MEDICATIONS (GENERICS)

A generic medication represents a group of drug names that refers to the same drug. A given generic medication may have an unlimited number of unique medication codes assigned to it. The table is sorted in alphabetical order by generic name and then by code. Note that not all generics in the database are assigned a code. Also, many generic medications that are not used currently in the software are kept in the database to preserve its integrity.

The GENERICS table drives the lookup in the Medications database during data entry. Due to limitations within the commercial database used, the generic names were required to fit into a single 30 byte field. As a result, drugs made with two or more compounds may have their generic names abbreviated to fit into the 30 byte space.

Example:

Generic	Code1
ammonium chloride/lic/glycer	
amobarbital	
amobarbital/secobarbital	
amoxapine	8004
amoxicillin	5001
amoxicillin	5021
amoxicillin/clavulanate	5001
amoxicillin/clavulanate	5021
amphetamine	

The partial GENERICS table shows two records for the generic “Amoxicillin” containing codes 5001 and 5021. Also note that there may be more than one generic name for similar compounds, such as “amoxicillin” and “clavulanate.” When the combination of generics occurs in the same record, it is recommended that they be separated by a slash (/).

When developing a data entry system that requires a medication group, it is recommended that specific medication groups be created and new codes assigned using **only** the medication generic name, since the software will update the GENERICS table with the new codes but will not perform any actions on the MEDS table (drugs table). The MedQuest Medications Maintenance utility can be used to assist with creating new medication codes. It is recommended that none of the generic names be deleted unless they are names that have been added during the development process. Removing a generic will result in the deletion of all drugs associated with that generic from the MEDS table (drugs table).

Table Definition

Object	Name	Data Type	Length
Table	GENERIC (Record Count: 4117)		
Column 1	GENERIC	Text	30
Column 2	CODE1	Text	4
Index	GENERIC (Unique: No)		
Index Field	GENERIC (Ascending)		

DRUGS (MEDS)

The MEDS table includes all the possible drug names, including trade names, found in medication records regardless of their generic names or codes. Currently, there are over 30,000 drug records included in the MEDS table. These are stored in alphabetical order by the "DRUGS" field. The drugs are linked to the generic table by the “GENERIC” field.

Example:

Drugs	Generic
AMOSTAT	caffeine
AMOX	amoxicillin
AMOX TR/K CLAVULANATE	amoxicillin/clavulanate
AMOXAPINE	amoxapine
AMOXICIL/CLAV ACID	amoxicillin/clavulanate
AMOXICIL/CLAY ACID	amoxicillin/clavulanate
AMOXICILLIN	amoxicillin
AMOXICILLIN TRIHYDRATE	amoxicillin
AMOXICILLIN-CLAVULANIC ACID	amoxicillin/clavulanate
AMOXICILLIN/CLAVULANATE	amoxicillin/clavulanate
AMOXIL	amoxicillin
AMOXIL CHEWABLE	amoxicillin
AMOXIL PEDIATRIC	amoxicillin

Each drug name is classified into a generic name. The trade names or the commonly used names in the Drugs column are unique, while a generic name may appear more than once. Some of the drugs are misspelled. These names were added after reviewing medications data which were abstracted in practice. This was done to ensure that the analysis would provide the most accurate indicator results.

Table Definition

Object	Name	Data Type	Length
Table	MEDS (Record Count: 30335)		
Column 1	DRUGS	Text	30
Column 2	GENERIC	Text	30
Index	DRUGS (Unique: No)		
Index Field	DRUGS (Ascending)		

Summary of differences between the MediSource™ Lexicon and the old MedQuest medications database:

	MediSource™ Lexicon	Old MedQuest Medications Database
Key Field	Brand name	Generic name
Generic names	More than 1 record for compound medications	Only one for each trade name
Misspellings and abbreviations	Names are industry standards, no misspellings/abbreviations included	Added as needed by users
Categories	Provided by the authors	Added as needed, sometimes by user request
Updates	Provided regularly by the authors	Performed as needed

LOOK UP TABLES

LABORATORY VALUE TABLE (TBLLABNORM)

The Laboratory Values table in the CLINDATA.MDB database is an assistive device which can be used when designing variables to collect clinical laboratory data. It lists normal ranges in both standard international units and conventional units which is the common way that results for the particular test are reported. It also lists the source for each test, which can be helpful if the test has more than one source.

Example:

labname	descriptor	specimen	cv_range	si_range	cv_units	si_units
Albumin		csf	10-30 mg/dL	100-300 mg/L	mg/dL	mg/L
Albumin		serum	3.5-5.0 g/dL	35-50 g/L	g/dL	g/L
Albumin		serum	3.5-5.0 g/dL	35-50 g/L	g/dL	g/L
Albumin		serum	52-68% of total	0.52-0.68 of total	%	
Albumin	Qualitative	urine	Negative	Negative		
Albumin	Quantitative	urine 24 h	10-100 mg/24 h	10-100 mg/24 h	mg/24 h	mg/24 h

Table Definition

Object	Name	Data Type	Length
Table	TBLLABNORM (Record Count: 504)		
Column 1	LABNAME	Text	65
Column 2	DESCRIPTOR	Text	50
Column 3	SPECIMEN	Text	20
Column 4	CV_RANGE	Text	45
Column 5	SI_RANGE	Text	45
Column 6	CV_UNITS	Text	16
Column 7	SI_UNITS	Text	16
Index 1	LABNAME (Unique: No)		
Index Field	LABNAME (Ascending)		
Index 2	category_id (Unique: No)		
Index Field 1	DESCRIPTOR (Ascending)		
Index Field 2	SPECIMEN (Ascending)		

DIAGNOSIS AND PROCEDURE CODE TABLES (ICD9DIAG & ICD9PROC)

The Diagnosis and Procedure Code tables (inside of ICD9.MDB) are similar. They are based on the ICD9-CM disease classification. The procedure codes are 4 bytes long, and the diagnosis codes are 5 bytes. They may include alphanumeric characters. Note that the period which separates the major disease or procedure classification and the subclass is not included in the codes. The description is a 30 byte field. These tables are used for the ICD9 lookup edit type and for entering data in the ICD9 memo fields.

Example:

Code	Desc
0023	PARATYPHOID FEVER C
0029	PARATYPHOID FEVER NOS
003	OTH SALMONELLA INFECTION*
0030	SALMONELLA ENTERITIS
0031	SALMONELLA SEPTICEMIA
0032	LOCAL SALMONELLA INFECT*
00320	LOCAL SALMONELLA INF NOS

Table Definition

Object	Name	Data Type	Length
Table	ICD9DIAG (Record Count: 15186)		
Column 1	CODE	Text	5
Column 2	DESC	Text	30
Index 1	CODE1 (Unique: No)		
Index Field	CODE (Ascending)		
Index 2	DESC1 (Unique: No)		
Index Field	DESC (Ascending)		

Table Definition:

Object	Name	Data Type	Length
Table	ICD9PROC (Record Count: 4275)		
Column 1	CODE	Text	5
Column 2	DESC	Text	30
Index 1	CODE1 (Unique: No)		
Index Field	CODE (Ascending)		
Index 2	DESC1 (Unique: No)		
Index Field	DESC (Ascending)		

ABBREVIATIONS TABLE (ABB.MDB)

The Abbreviations table enables the data abstractor to search for the abbreviation of a specified clinical term. This table can be updated using MedQuest.

Example:

Abbrev	Lookup
nsy	nursery
NT	nasotracheal
NTG	nitroglycerine
NWB	non-weight bearing
O	oral
O & P	ova and parasites

Table Definition

Object	Name	Data Type	Length
Table	ABB (Record Count: 967)		
Column 1	ABBREV	Text	20
Column 2	LOOKUP	Text	80
Index	ABBREV (Unique: No)		
Index Field	ABBREV (Ascending)		

CLINICAL HELP HEADINGS (TBLHEADINGS)

The Headings table in CLINDATA.MDB is a master list of general headings. The MedQuest user can select from this while developing the Sources and Instructions sections of clinical help for a screen or a variable. They are designed to foster consistency and reduce the number of keystrokes needed to create the clinical help. This table can be updated only through Microsoft Access.

Example:

Heading	Type
Additional Source:	Sources
Additional Sources:	Sources
Definition:	Instructions
Definitions:	Instructions
Example:	Instructions
Examples:	Instructions

Table Definition

Object	Name	Data Type	Length
Table	TBLSOURCES (Record Count: 35)		
Column 1	SOURCE	Text	50
Column 2	TYPE	Text	50
Index	SOURCE (Unique: No)		
Index Field	SOURCE (Ascending)		

CLINICAL HELP SOURCES (TBLSOURCES)

The Sources table in CLINDATA.MDB is a master list of sources of clinical information. The MedQuest user can specify which data sources should be used by abstractors to extract data for a given screen or variable. They are designed to foster consistency and reduce the number of keystrokes needed to create the clinical help. This table can be updated only through Microsoft Access.

Example:

Source
Face sheet
Graphic sheet
History and physical (H&P)
ICU flow sheet
IV flow sheets
Laboratory reports
Medication records

Table Definition

Object	Name	Data Type	Length
Table	TBLSOURCES (Record Count: 35)		
Column 1	SOURCE	Text	50
Index	SOURCE (Unique: No)		
Index Field	SOURCE (Ascending)		